

What is claimed is:

1. A rheoforming apparatus, comprising:

a first sleeve, an end of which is formed with an outlet vent for releasing slurries;

5 a second sleeve for receiving molten metals, an end of the second sleeve being hinge-connected to the other end of the first sleeve at a predetermined angle;

a stirring unit for applying an electromagnetic field to an area of the second sleeve in which the molten metals are present;

10 a plunger, which is inserted into the other end of the second sleeve to block the other end of the second sleeve for receiving the molten metals and to pressurize the slurries; and

a forming unit, which is connected to the outlet vent of the first sleeve to form products with a predetermined shape using the slurries.

15 2. The rheoforming apparatus according to claim 1, wherein the forming unit is an extrusion unit provided with a transfer roller and a cooler.

3. The rheoforming apparatus according to claim 1, wherein the forming unit is a press-forming unit provided with a press die.

20 4. The rheoforming apparatus according to claim 1, further comprising a first temperature control element, which is installed around the first sleeve to adjust the temperature of the slurries pressurized toward the outlet vent.

25 5. The rheoforming apparatus according to any one of claims 1 to 4, wherein the stirring unit applies the electromagnetic field to the second sleeve prior to loading the molten metals into the second sleeve.

30 6. The rheoforming apparatus according to any one of claims 1 to 4, wherein the stirring unit applies the electromagnetic field to the second sleeve simultaneously with loading the molten metals into the second sleeve.

7. The rheoforming apparatus according to any one of claims 1 to 4, wherein the stirring unit applies the electromagnetic field to the second sleeve in the

middle of loading the molten metals into the second sleeve.

8. The rheoforming apparatus according to any one of claims 1 to 4, wherein the stirring unit applies the electromagnetic field to the second sleeve until the molten metals in the second sleeve have a solid fraction of 0.001-0.7.

9. The rheoforming apparatus according to claim 8, wherein the stirring unit applies the electromagnetic field to the second sleeve until the molten metals in the second sleeve have a solid fraction of 0.001-0.4.

10. The rheoforming apparatus according to claim 9, wherein the stirring unit applies the electromagnetic field to the second sleeve until the molten metals in the second sleeve have a solid fraction of 0.001-0.1.

11. The rheoforming apparatus according to any one of claims 1 to 4, wherein the molten metals in the second sleeve is cooled until the molten metals have a solid fraction of 0.1-0.7.

12. The rheoforming apparatus according to claim 11, further comprising a second temperature control element, which is installed around the second sleeve to cool the molten metals in the second sleeve.

13. The rheoforming apparatus according to claim 12, wherein the second temperature control element comprises at least one of a cooler and a heater, which are installed around the second sleeve.

14. The rheoforming apparatus according to claim 12, wherein the second temperature control element cools the molten metals in the second sleeve at a rate of 0.2-5.0°C/sec.

15. The rheoforming apparatus according to claim 14, wherein the second temperature control element cools the molten metals in the second sleeve at a rate of 0.2-2.0°C/sec.